Foraging ecology and climate change vulnerability of Chatham Island tāiko

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Climate change is one of the most important threats to seabirds worldwide, affecting almost as many species as bycatch and hunting/trapping. It mostly affects species by altering habitats (breeding sites and/or oceanographic conditions) and ecosystem processes. Around Aotearoa New Zealand, ocean temperature, acidity, and the frequency of marine heatwaves are increasing and one of the most important climate change impacts on oceanographic conditions is predicted to occur along the Chatham Rise, near the Chatham Islands. The Critically Endangered Chatham Island tāiko/tchaik *Pterodroma magentae* (c. 100 adults, Nationally Critical) is endemic to the archipelago, and these predicted climate change induced alterations of the marine environment around the Chatham Islands could reduce the forage availability of this threatened species and have knock on effects on its population dynamics. To better assess and predict how climate change might affect this critically endangered species it is crucial to improve our understanding of the species foraging ecology.

To this end we tracked breeding Chatham Island tāiko with GPS. The initial plan was to deploy 10 GPS following the staged approach initiated in the previous breeding season. In the 2022-23 breeding season we tested the effect of tagging on tāiko during periods of the species' breeding cycle with low risk on the breeding success (i.e., newly paired birds and mid to late chick rearing). The results of these tests were positive. As such, this year we deployed GPS on birds straight from late incubation to track the part of the species' breeding cycle when the birds' foraging trips are the most constrained: early chick rearing. By the time we had deployed 8 GPS, two of the birds had already abandoned their nest and a third one abandoned its nest a couple of days later. Given the sensitivity of this species (c. 100 individuals) it was decided to stop tagging for the season. The remaining 5 tagged birds continued breeding successfully and were recaptured mid-March. The 5 GPS were recovered and all recorded data.

The tracks were described in terms of trip range (i.e., maximum distance from burrow), length, and duration. Chick rearing trips lasted on average 4.83 ± 2.66 d (mean ± SD) (range: 0.72-10.87 d), with a trip range of 574 ± 431 km (91-2175 km), and a length of 2,856 ± 1,865 km (425-8285 km). The birds flew mostly south-southeast of the Chatham Islands (Figure 1). The utilisation distribution (UD) was calculated using kernel density estimation and the centre of the chick rearing core area (50% UD; 181,425 km^2) lies c. 140 km off to the south of the main Chatham Island. They seem to prefer the southern shelf break of the Chatham Rise and the deep waters in the south and southeast rather than the shallower waters of the Chatham Rise, the Campbell Plateau and the Bounty Plateau. Analyses are underway to identify the environmental drivers of Chatham Island tāiko movements and how climate change might affect those movements.

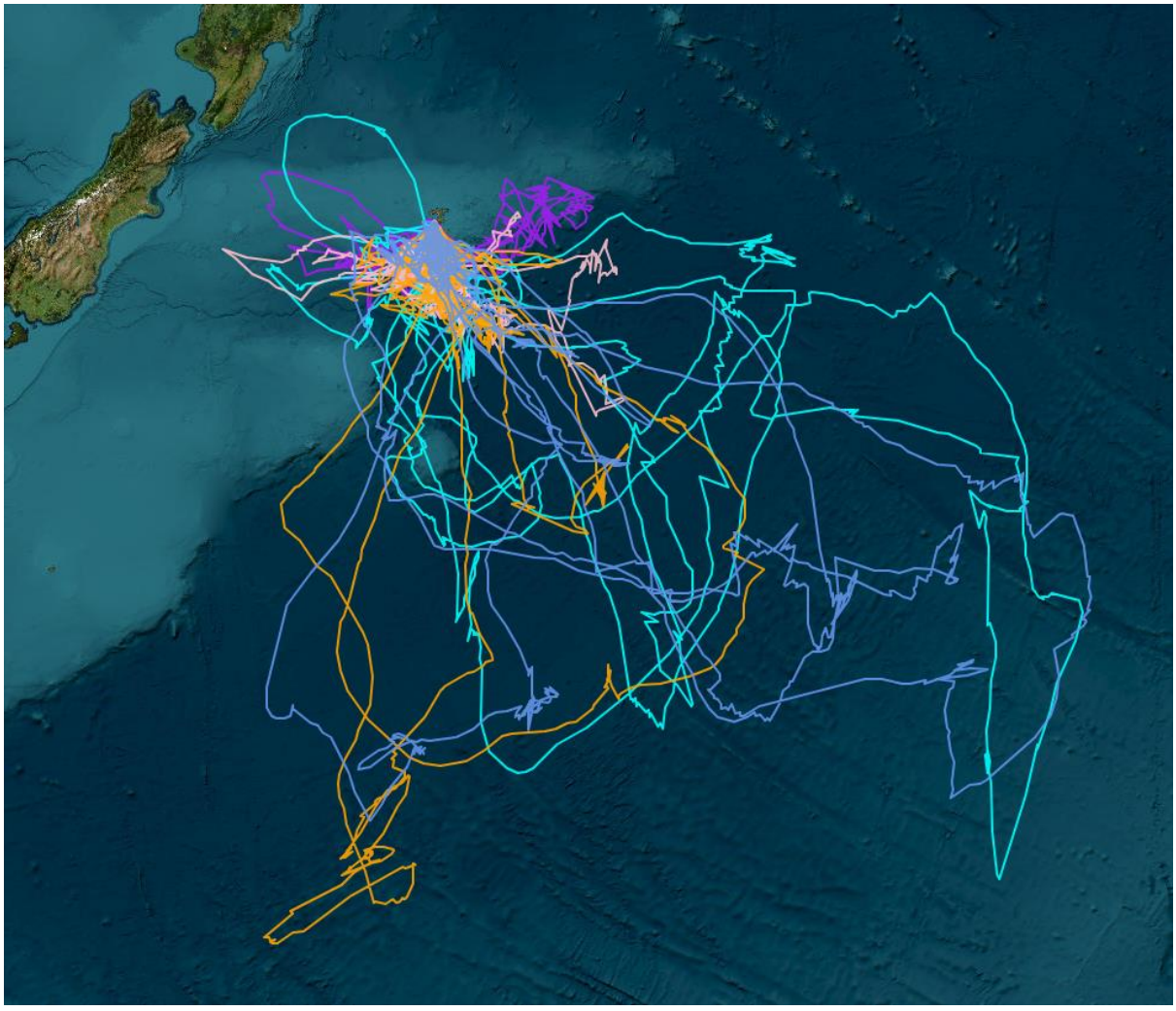

Figure 1. Tracks of chick-rearing Chatham Island tāiko tracked with GPS during the 2023-2024 breeding season.